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VOL. 9 NO. 12 MARCH 20, 1959

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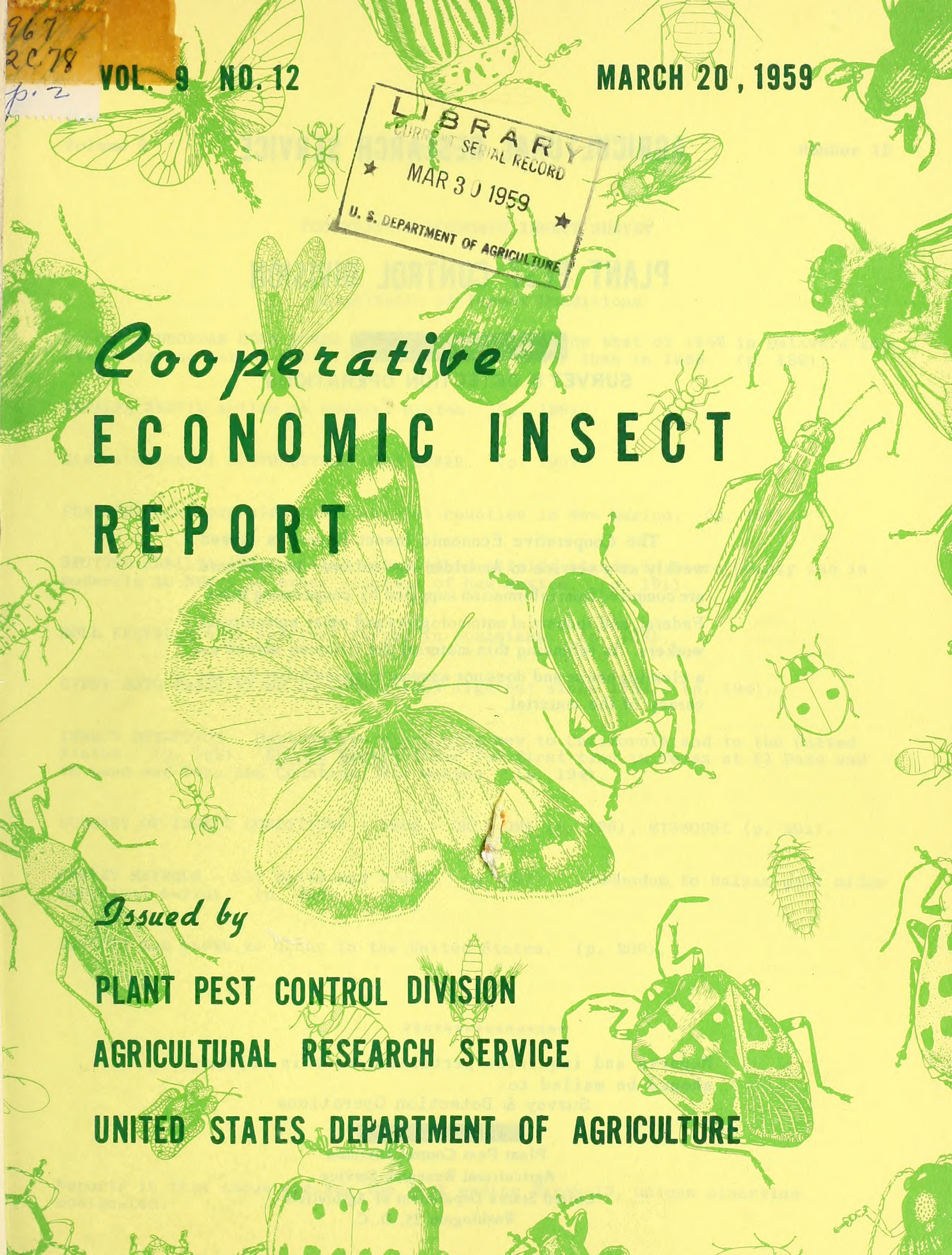

Cooperative ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

PLANT PEST SURVEY

SURVEY & DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Plant Pest Survey
Plant Pest Control Division
Agricultural Research Service
United States Department of Agriculture
Washington 25, D. C.

Volume 9 March 20, 1959 Number 12

COOPERATIVE ECONOMIC INSECT SURVEY

Highlights of Insect Conditions

Present EUROPEAN CORN BORER spring population twice that of 1958 in Delaware and overwintering larval mortality in Kansas is lower than in 1958. (p. 189).

ALFALFA WEEVIL active in several states. (p. 189).

Distribution of SOUTHWESTERN CORN BORER. (p. 190).

PEA APHID damaged alfalfa in several counties in New Mexico. (p. 191).

SPOTTED ALFALFA APHID killed established alfalfa stands in Otero County and is moderate to heavy in other counties of New Mexico. (p. 191).

BOLL WEEVIL winter survival survey in Louisiana. (p. 193).

GYPSY MOTH infestation in Connecticut lightest since 1952. (p. 194).

INSECT DETECTION: Haplothrips clarisetis new to California and to the United States. (p. 193). Khapra beetle found for first time in Texas at El Paso and in Luna and Dona Ana Counties, New Mexico. (p. 194).

SUMMARY OF INSECT CONDITIONS - 1958 - OKLAHOMA (p. 196), MISSOURI (p. 201).

SURVEY METHODS - Fly baits and traps. (p. 207). Addendum to balsam gall midge appraisal survey. (p. 208).

INSECTS not known to occur in the United States. (p. 209).

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Reports in this issue are for the week ending March 13, unless otherwise designated.

WEATHER BUREAU 30-DAY OUTLOOK

MID-MARCH TO MID-APRIL 1959

The Weather Bureau's 30-day outlook for the period mid-March to mid-April calls for temperatures to average below seasonal normals from the Great Lakes eastward to New England, and also along the Gulf and South Atlantic coasts. Above normal averages are expected over most areas west of the Continental Divide and also over the Central and Northern Plains. In unspecified areas, near normal temperatures with wide fluctuations are anticipated. Precipitation is predicted to exceed normal from the Midwest northeastward through New England, as well as in Gulf and South Atlantic States. Subnormal amounts are indicated for the Central and Southern Plateau, California and the Central Plains. Elsewhere, near normal amounts are in prospect.

Weather forecast given here is based on the official 30-day "Resume and Outlook", published twice a month by the Weather Bureau. You can subscribe through Superintendent of Documents, Washington 25, D. C. Price $4.80 a year, $2.40 a half year.

WEATHER OF THE WEEK ENDING MARCH 16

Last week's weather, typical of March, was blustery with frequent temperature changes and rather general moderate to heavy precipitation east of the Mississippi River. The weather in the eastern half of the Nation was controlled mainly by two low pressure disturbances which gained strong storm intensity as they moved northeastward. The first storm, March 11 to 13, moved in an erratic course from the lower Mississippi Valley to an offshore position along the north Atlantic coast and finally turned northward across eastern Maine. This storm produced heavy rains in the South and heavy snows in the Northeast as high winds raked the entire east coast. Snowfalls ranged up to 10 inches in the central Appalachians, from 3 inches at Massena to 20 inches at Cobleskill in New York State, and from 5 to 15 inches in southern portions and 12 to 20 inches in northern portions of New England. Lightest amounts in New England, under 10 inches, fell in southern coastal areas where scattered thunderstorms with hail occurred and some precipitation fell as rain or sleet. Traffic was greatly hampered in New England, many schools closed and eleven deaths were blamed on the storm. Total snow depths increased to 45 to 55 inches in northern Maine and 30 to 40 inches in northern sections of New Hampshire and Vermont. The second storm, March 14 to 16, moved from the lower Great Plains across the Great Lakes, and was responsible for more heavy rains in the South and a band of heavy drifting snow from Nebraska to Michigan. Three to 12 inches of drifted snow closed most highways in the northeastern half of Iowa, 8 to 10 inches closed roads in a 100-mile-wide belt from southwest to east central portions of Wisconsin and 10 to 15 inches of new snow isolated some communities in northern Michigan. Similar conditions also were experienced in southeastern Minnesota and extreme northwestern Illinois. Tornadoes were reported in Arkansas, were suspected in southeastern Illinois, and high winds estimated at 80 to 100 m.p.h. at Memphis, Tennessee, on the 14th, caused damage of about $250,000. Damaging winds raked the entire State of Michigan on Sunday, the 15th.

Winds raised dust on several days in eastern Colorado, in New Mexico on the 14th, and in many sections of Arizona on both the 11th and 15th. In Oklahoma strong winds on Saturday, the 14th, caused much blowing dust and blew several grass and brush fires out of control. Thousands of acres were burned over in the State, and some cattle and property were lost. This was the second consecutive week with temperatures about normal in most of the country. Highest average departures from normal were 6° above in portions of North Dakota and Minnesota and along the southern California coast, and 6° below in the extreme Northeast. Freezing, however, was widespread, occurring everywhere except in

(Weather continued on page 195)

CEREAL AND FORAGE INSECTS

GRASSHOPPERS - ARIZONA - Few first-instar nymphs of *Melanoplus bilituratus* in alfalfa near Tempe, Maricopa County. *Aulocara elliotti* and *M. bilituratus* hatching in the intermountain short grass range areas in the southeast earlier than usual, probably due to low rainfall and sparse growth of annual plants. Egg survival sampling in study areas indicates an abundance of grasshoppers in 1959 if weather conditions are favorable for hatching. (Ariz. Coop. Sur.).

SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) - MISSOURI - Brief check of one corn field in Jasper County revealed approximately 30 percent of larvae overwintered. (Kyd, Thomas).

EUROPEAN CORN BORER (*Pyrausta nubilalis*) - DELAWARE - The spring abundance survey showed an overwintering survival rate of 46 percent, which represents a rather high population of borers based on the fall data of 248.5 borers per 100 plants. Furthermore, the average number of live borers per infested plant revealed a present spring population that is twice as high as that for the spring of 1958 (1.7 borers per infested stalk in 1959 compared with 0.85 in 1958). Indications are, that should weather conditions this season again favor borer development, possibly 1959 will be another record year for this species in the State. (Burbutis, Conrad). NORTH CAROLINA - Area of previous highest infestation in potato production area of Pasquotank County, with 46 forms per 100 corn stalks and 4 of these newly pupated. (Farrier). KANSAS - Survey of 11 fields in Jefferson County showed mechanical mortality at harvest plus overwintering mortality to be 66 percent, which is lower than the 86 percent in 1958. (Burkhardt, Peters).

ALFALFA WEEVIL (*Hypera postica*) - DELAWARE - Second-instar larvae common on young alfalfa in Sussex County. (Burbutis, Conrad). VIRGINIA - Larvae feeding on alfalfa in Princess Anne, Southampton and Prince George Counties (Morris) and in Nansemond County (Boush). Practically all larvae are in the first instar. No stands of fall-seeded alfalfa have been infested to date. (Morris). GEORGIA - Feeding injury occurred on 10-50 percent of plants in fields in Oconee, Clarke, Putnam, Oglethorpe, Wilkes, Lincoln, Hancock, Washington and Johnson Counties. (Johnson). NEVADA - Adults have been active and laying eggs since early February in Churchill, Douglas, Lyon, Pershing and Washoe Counties. Treatment completed in many fields and being applied in others. (Nev. Coop. Rpt., March 6). UTAH - Adults active in alfalfa fields in Box Elder and Weber Counties, on warm south slopes. (Knowlton).

CLOVER LEAF WEEVIL (*Hypera punctata*) - VIRGINIA - Larvae observed in Prince George County. (Morris). MISSOURI - Averaged 1-4 early-instar larvae per alfalfa crown over west central and southwest areas. (Kyd,Thomas).

LESSER CLOVER LEAF WEEVIL (*Hypera nigrirostris*) - NEVADA - Adults active and in moderate numbers on red clover in Smith Valley, Lyon County.(Batchelder, March 6).

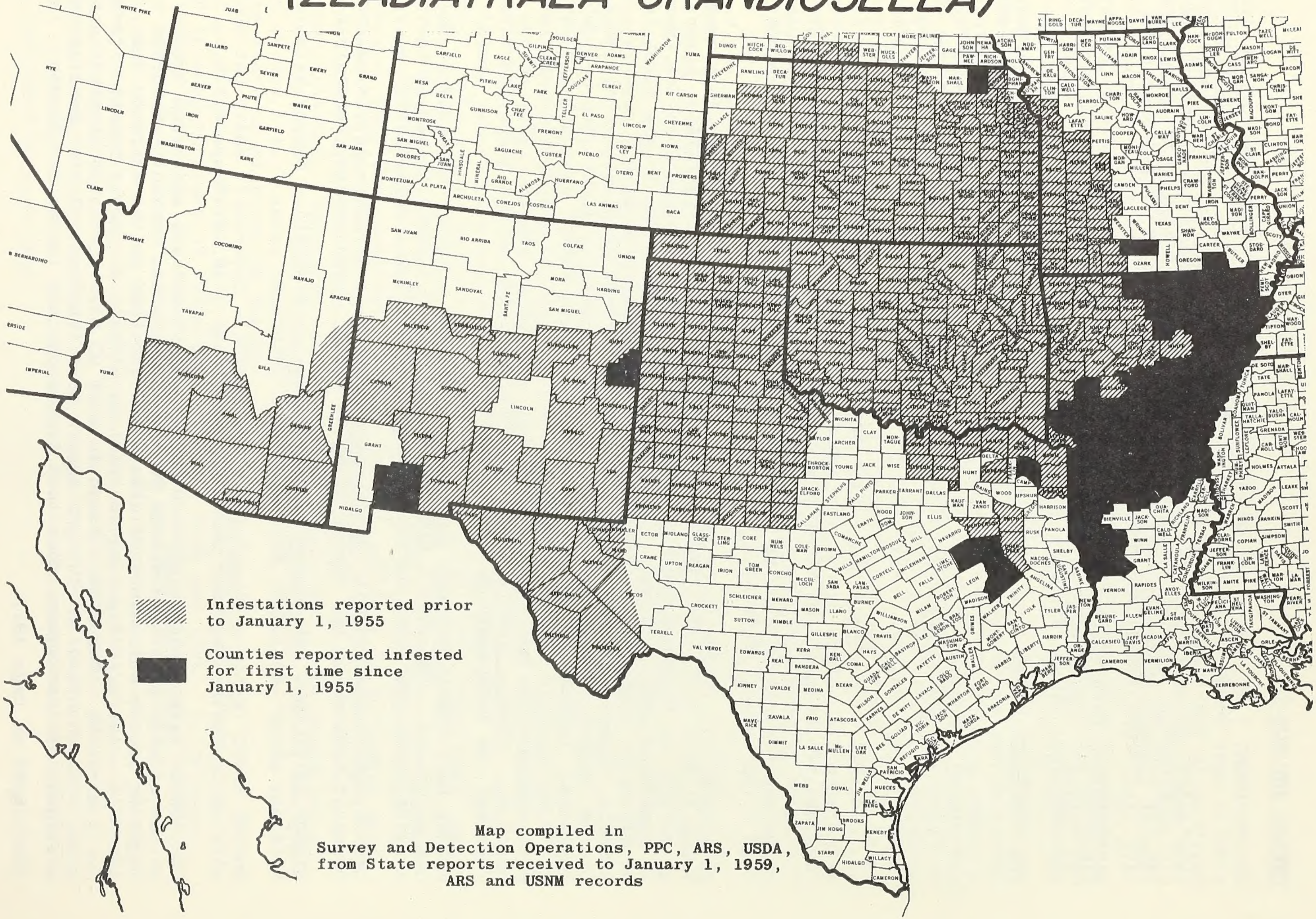
MEADOW SPITTLEBUG (*Philaenus leucophthalmus*) - VIRGINIA - Nymphs hatching in alfalfa, clover and other forage crops. (Morris).

COWPEA APHID (*Aphis medicaginis*) - NEW MEXICO - Moderately heavy but spotty on alfalfa in Dexter-Hagerman area, Chaves County. (N. M. Coop. Rpt.).

PEA APHID (*Macrosiphum pisi*) - DELAWARE - Stem mothers and young nymphs common on new alfalfa growth in Sussex County. (Burbutis, Conrad). VIRGINIA - Very light in practically every alfalfa field surveyed in the State to date. (Morris). ARKANSAS - Averaged 2 per square foot on alfalfa in Conway County. (Ark. Ins. Sur., March 9). OKLAHOMA - Found in 8 of 23 alfalfa fields checked in central area, with counts of 20-100 per square foot (VanCleave,Ritter,Pennington) and averaged 2-30 per square foot in 2 fields checked in Choctaw County. (Goin).

(Continued on page 191)

DISTRIBUTION OF SOUTHWESTERN CORN BORER
(ZEADIATRAEA GRANDIOSELLA)



▨ Infestations reported prior to January 1, 1955

■ Counties reported infested for first time since January 1, 1955

Map compiled in
Survey and Detection Operations, PPC, ARS, USDA,
from State reports received to January 1, 1959,
ARS and USNM records

ARIZONA - Medium but increasing slightly on alfalfa in the Salt River Valley. (Ariz. Coop. Sur.). NEW MEXICO - Extremely heavy infestations damaged alfalfa in Otero, De Baca, Chaves, Eddy and Roosevelt Counties. Lighter in other southern counties. Many growers have applied controls. (N. M. Coop. Rpt.). MISSOURI - Ranged 0-9 per alfalfa crown in west central and southwest areas. Few winged adults observed in southwest area. (Kyd, Thomas).

SPOTTED ALFALFA APHID (*Therioaphis maculata*) - ARKANSAS - None found in alfalfa in Conway County. (Ark. Ins. Sur., March 9). OKLAHOMA - Present in 15 of 23 alfalfa fields checked in central area. Counts ranged 10-2,000 per square foot, with plants in many fields becoming sticky. (VanCleave, Ritter, Pennington). Very scarce in 3 alfalfa fields checked in the Braggs area of Muskogee County (Washum) and ranged 0-1 per square foot in 2 alfalfa fields in Choctaw County (Goin). Averaged 288 per square foot of crown area in fields checked in Payne County (Ketner). TEXAS - Few fields on stream bottoms have been heavily infested in Denton County. Controls were applied. Most other fields only lightly infested, but populations may build up rapidly. (Chada). ARIZONA - Increased slightly on alfalfa in the Salt River Valley. (Ariz. Coop. Sur.). NEW MEXICO - Heavy populations killed established stands of alfalfa at Tularosa, Otero County. Infestations heavy on alfalfa near Bethel, Roosevelt County, and moderate to heavy in Chaves and Eddy Counties. Many growers treating. (N. M. Coop. Rpt.). KANSAS - None found in Republic, Cloud, Riley and Pottawatomie Counties March 6-8. (Simpson, Burkhardt). MISSOURI - None observed in west central and southwest areas. (Kyd, Thomas).

AN APHID - NEVADA - Winged and wingless forms heavy on 30 acres of red clover in Smith Valley, Lyon County. (Batchelder, March 6).

LYGUS BUGS (*Lygus* spp.) - DELAWARE - Some *L. lineolaris* adults on alfalfa in New Castle County. (Burbutis, Conrad). UTAH - Active in alfalfa fields and meadows near Brigham and Plain City. Mostly *L. elisus*. (Knowlton).

CLOVER LEAFHOPPER (*Aceratagallia sanguinolenta*) - DELAWARE - Adults on clover in Sussex County. (Burbutis, Conrad).

GREENBUG (*Toxoptera graminum*) - ARKANSAS - Averaged less than one per linear foot on oats in Faulkner and Conway Counties. (Ark. Ins. Sur., March 9). OKLAHOMA - Present in 26 of 36 small grain fields checked in central area. Counts ranged 1-100 per linear foot with heaviest numbers in isolated fields in northern Grady, Canadian and southern Kingfisher Counties. (VanCleave, Ritter, Pennington). Ranged 0-25 per linear foot in small grain fields in Hennessey-Kingfisher area. Averaged 40 per linear foot in one field. (Wood). Populations of 30-1,000 per linear foot in small grain fields checked in Cotton, Tillman and southern Kiowa Counties, with dead spots in some fields. (Hatfield). Averaged 5 per linear foot in 2 fields checked in northern Kiowa County (Hudson), 2 per linear foot in 2 wheat fields in northwestern Texas County (Owens) and none were found in 4 fields checked in the Arkansas River bottoms (Washum). TEXAS - Light, 25 per foot of row, in Knox County. (Turney). Readily found in 48 of 57 fields examined in 16 central and southern counties. Averaged less than one per foot of row in 14 fields, 2-25 in 32 fields and more than 100 per foot of row in 2 fields, with considerable damage. Heaviest infestations were in Gillespie, Kendall, Kerr and McLennan Counties. (Chada). MISSOURI - No specimens or evidence of damage observed in small grains in west central and southwest areas. (Kyd, Thomas). NEW MEXICO - Averaged 10-50 per linear foot of row in wheat near Clovis, Curry County. Lighter in dry land and irrigated wheat in other areas of Curry and Roosevelt Counties. (N. M. Coop. Rpt.).

APPLE GRAIN APHID (*Rhopalosiphum fitchii*) - OKLAHOMA - Counts ranged 1-300 per linear foot in 23 of 36 small grain fields checked in central area. (VanCleave, Ritter, Pennington). Populations in one field near Grandfield, Tillman County, approaching 600 per linear foot. (Hatfield). Averaged 10 per linear foot in

2 wheat fields in northwestern Texas County. (Owens). TEXAS - Light infestations observed, especially in fields of volunteer grain. (Chada).

CORN LEAF APHID (Rhopalosiphum maidis) - ARIZONA - Continued heavy, 40-50 per plant, in many barley fields in Maricopa County. Averaged 5 per plant in 12 fields sampled in Pinal County. (Ariz. Coop. Sur.).

ENGLISH GRAIN APHID (Macrosiphum granarium) - ARKANSAS - Averaged less than one per linear foot on oats in Faulkner and Conway Counties. (Ark. Ins.Sur., Mar.9). OKLAHOMA - Present in 7 of 36 small grain fields checked in central area. Counts ranged 1-5 per linear foot. (VanCleave, Ritter, Pennington). TEXAS - Light infestations observed, especially in fields of volunteer grain. (Chada). MISSOURI - Averaged 0-2 per linear foot of row in wheat over west central and southwest areas, with an occasional winged form observed. (Kyd, Thomas).

ARMY CUTWORM (Chorizagrotis auxiliaris) - KANSAS - Averaged 3-5 per linear foot of row in several areas in a wheat field in Ellis County. (Harvey). Probably this species reported in wheat, alfalfa and barley in the south central area. (Marvin).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light infestations in 2 isolated small grain fields checked in central area averaged less than one per linear foot. (VanCleave, Ritter, Pennington). TEXAS - Present in 14 of 57 fields examined in 16 southern and central counties, with heaviest infestations in the Comfort-Kerrville-Fredericksburg and the McGregor areas. Populations decreasing rapidly with advent of warm weather. Some controls applied in the southern area. (Chada). MISSOURI - None observed in any small grain fields in southwest area. Damage to orchardgrass reported in Christian County. (Kyd, Thomas).

FRUIT INSECTS

PEAR PSYLLA (Psylla pyricola) - CALIFORNIA - Eggs light to heavy on pear trees in Newcastle area, Placer County. (Cal. Coop. Rpt.).

CITRUS THRIPS (Scirtothrips citri) - ARIZONA - Increasing on Yuma Valley citrus. (Ariz. Coop. Sur.).

CITRUS FLAT MITE (Brevipalpus lewisi) - ARIZONA - Increasing on citrus in the Yuma Valley. Controls required in some cases. (Ariz. Coop. Sur.).

Citrus Insect Situation, Lake Alfred, Florida, First Week in March - PURPLE SCALE activity increased slightly but is expected to rise more rapidly during the remainder of March. Infestation level is currently very low for this time of year. Hatching will increase during next 14 days. Little change in FLORIDA RED SCALE activity. Present high level will continue for next 2 weeks. Little change in CITRUS RED MITE activity, which will remain near present level for 2-3 weeks. CITRUS RUST MITE activity increased slightly on leaves and decreased on fruit, with an overall level slightly higher than average for this time of year. An increase is expected during the next 14 days. TEXAS CITRUS MITE is increasing, but is still less prevalent than in December and January. (Simanton, Thompson, Johnson).

DARKLING BEETLES (Blapstinus spp.) - ARIZONA - Damaged grapes in Yuma County by breeding in new buds in recently cultivated fields. (Ariz. Coop. Sur.).

TWIG GIRDLER (Oncideres cingulata) - VIRGINIA - Damaged a number of pecan trees in Appomattox County by girdling many twigs. (Morris, Motley).

TRUCK CROP INSECTS

APHIDS - OKLAHOMA - General infestations on tomato and pepper plants in greenhouses in Logan County. (Latham).

BEET LEAFHOPPER (Circulifer tenellus) - NEVADA - Populations in southern Nevada breeding grounds were very light in mid-February. Only traces of host plants were found and over 80 percent of sampling failed to yield specimens for viruliferous tests. About 3 percent of specimens collected were found capable of transmitting curly top. (Dorst, Zoller, March 6).

DIAMONDBACK MOTH (Plutella maculipennis) - GEORGIA - Light on cabbage in Colquitt, Brooks and Lowndes Counties. (Johnson).

CABBAGE APHID (Brevicoryne brassicae) - GEORGIA - Light on cabbage in Colquitt, Brooks and Lowndes Counties. (Johnson).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Averaged 10 per lettuce plant in some fields in Maricopa County. (Ariz. Coop. Sur.). CALIFORNIA - Medium on young lettuce in the Soledad area, Monterey County. (Dr. L. McLean).

THRIPS - ARIZONA - Injury resulted in culling of a lettuce field near Yuma. Numerous near Queen Creek, Maricopa County. (Ariz. Coop. Sur.).

CONCHUELA (Chlorochroa ligata) - TEXAS - Light infestations attacking spinach and mustard in Zavala County. (Harding).

RED-NECKED CANE BORER (Agrilus ruficollis) - NORTH CAROLINA - Infesting boysenberry canes in Davidson County. (Bernhardt, Farrier).

A THRIPS (Haplothrips clarisetis) - CALIFORNIA - A new African-Near Eastern species reported from Riverside County infesting dandelions, Russian thistle and mesembryanthemum. Verified by Dr. J. Faure as this species or very near. Dandelions are a specialty commercial crop in the State. Economic value of thrips not determined. This species is new to the State and to the United States. (Dr. W. H. Ewart).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light on tobacco beds in Tift, Colquitt, Brooks, Lowndes, Cook, Berrien and Coffee Counties and moderate in Bacon, Appling, Tattnall, Evans and Bulloch Counties. (Johnson).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light on tobacco beds in Bacon and Tattnall Counties. (Johnson).

GREEN PEACH APHID (Myzus persicae) - GEORGIA - Light on tobacco plant beds in 11 tobacco-growing counties. (Johnson).

COTTON INSECTS

Boll Weevil Winter Survival Survey: LOUISIANA - Collections of surface woods trash made February 24 to March 6 in the northeast area showed 3,067 weevils per acre in East Carroll, 3,026 in Madison and 646 in Tensas Parishes, with an average of 2,246 for the three parishes. Compared with the fall population of 5,756 per acre, this gives a winter survival of 39 percent. During the 23 years that these records have been made in Madison Parish, the number of weevils per acre (3,026) found this spring, has been exceeded only once in the spring of 1956, when 3,654 weevils per acre were found. (Smith et al.).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

A PINE TIP MOTH - Adults have begun to emerge in southern areas. Numbers appear to be light. (Ark. For. Pest Rpt., March).

AN ARCTIID (*Halisidota* sp., prob. *argentata*) - CALIFORNIA - Heavy on fir trees in Santa Rosa, Sonoma County. (Cal. Coop. Rpt.).

GYPSY MOTH (*Porthetria dispar*) - CONNECTICUT - In 1959, 9,600 acres in 10 towns have been certified as in danger of infestation reaching epidemic proportions. The infestation is heavy enough to cause more than 50 percent defoliation on only approximately 700 acres in Bethany. This is the lightest infestation since 1952. (Turner).

RHODODENDRON BORER (*Ramosia rhododendri*) - DELAWARE - Infesting many plants in New Castle County. This infestation survived a thorough treatment applied in 1958. (Burbutis, Conrad).

SCALE INSECTS - MARYLAND - *Aspidiotus* sp., *Asterolecanium puteanum* and *Leucaspis japonica* infesting holly (*Ilex crenulata*) at Cabin John, Montgomery County, March 10. (U. Md., Ent. Dept.). OKLAHOMA - *Coccus hesperidum* taken on chrysanthemums at Cushing, March 3, and *Unaspis euonymi* heavy on *Euonymus japonica* at Chickasha, March 9. (Apt). CALIFORNIA - *Phenacaspis pinifoliae* and *Aspidiotus californicus* heavy on pine in Applegate, Placer County. (Cal. Coop. Rpt.).

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - OKLAHOMA - Adults active at Stillwater, Payne County. (Ealy).

INSECTS AFFECTING MAN AND ANIMALS

MOSQUITOES - NEVADA - *Aedes campestris* and *A. niphadopsis* third and fourth-instar larvae present in seepage ponds in Fallon-Hazen area, Churchill County. *Aedes* sp. first-instar larvae present in snow pools in Lake Tahoe area. (Chapman, March 6).

CATTLE LICE - OKLAHOMA - Heavy on cattle in Le Flore County. (Washum).

STORED-PRODUCT INSECTS

KHAPRA BEETLE (*Trogoderma granarium*) - TEXAS - Found for the first time in the State in a feed mill in El Paso, El Paso County, February 9. As of March 16, cooperative surveys have revealed an additional 13 infestations in various types of establishments in the same county. These are classified as one heavy, 5 light and 7 very light. NEW MEXICO - Since report in CEIR 9(11):171, of finds in Sierra County, as of March 16, one additional infestation has been found in that county, one in Luna and 8 in Dona Ana Counties. The latter two counties are reported for the first time. (PPC).

CONFUSED FLOUR BEETLE (*Tribolium confusum*) - TEXAS - Light infestation at bottom and on surface of grain in Van Zandt County. Adults medium and attacking barley and oats in Howard County and heavy in wheat warehouse on Texas-Oklahoma State line. Light in Lubbock County. (Texas Coop. Rpt.).

CORN SAP BEETLE (*Carpophilus* sp.) - ARIZONA - Infested wet grain sorghum brought to Phoenix for storage. (Ariz. Coop. Sur.).

FLAT GRAIN BEETLE (*Laemophloeus pusillus*) - TEXAS - Medium in milo in Lubbock County. (Texas Coop. Rpt.).

GRAIN WEEVILS - TEXAS - *Sitophilus oryza* medium to heavy and attacking stored grain in Uvalde and Howard Counties and infestations noted along Oklahoma-Texas State line. (Texas Coop. Rpt.). Light in stored milo in Haskell County. (Turney). Unknown species reported in milo in Potter, Hale and Hamilton. *Sitophilus* sp.light in Van Zandt County and heavy in Lubbock County. (Texas Coop. Rpt.).

LESSER GRAIN BORER (*Rhyzopertha dominica*) - TEXAS - Medium to heavy on wheat and milo in Potter County and around Oklahoma-Texas State line. (Texas Coop. Rpt.). Light in milo in Haskell County. (Turney).

SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*) - TEXAS - Adults attacking stored wheat near Oklahoma-Texas State line. (Texas Coop. Rpt.).

BENEFICIAL INSECTS

PARASITES - TEXAS - Parasitism by *Aphidius testaceipes* heavy in fields heavily infested by greenbug in 16 central and southern counties. Greenbugs practically eliminated in several fields in Gillespie and McLennan Counties. It is believed the parasite will keep the greenbug population down to a point where no more damage will occur to the crops. (Chada).

PREDATORS - OKLAHOMA - *Hippodamia convergens* becoming common in alfalfa and small grain fields in central area but averaged less than 0.3 per linear foot (VanCleave, Ritter, Pennington), and numerous adults active in Kiowa County fields. (Hatfield, Hudson).

LIGHT TRAP COLLECTIONS

	Pseud. unip.	Agrot. yps.	Prod. ornith.	Perid. marg.	Feltia subt.
ARIZONA					
Mesa 3/4-10			18	4	
ARKANSAS					
Fayetteville 2/26-3/4				1	
Kelso 2/26-3/4		2		3	
Morrilton 2/26-3/4				1	
SOUTH CAROLINA					
Charleston 3/9-15	20	3		5	1
Clemson 3/7-13		1		1	

Weather continued from page 188

the Gulf, south Atlantic and Pacific coastal areas and the extreme Far Southwest Subzero minima were limited to the upper Great Lakes region and upper portions of New England and New York State. No precipitation fell from western Texas to California and weekly totals were generally light to very light elsewhere west of the Continental Divide. However, the snowpack increased slightly in the Cascades. The snow cover melted in the northern Great Plains by the end of the period, although some drifts were still left. From 1 to 2 feet of snow still covers most of Wisconsin and the cover is still heavy in northeastern Iowa, eastern Minnesota and northern Michigan. The cover in the Northeast is limited mostly to New England and eastern and northern New York, with extreme depths ranging up to more than 3 feet. (Summary supplied by U. S. Weather Bureau).

SUMMARY OF INSECT CONDITIONS - 1958

OKLAHOMA

Reported by Horace W. VanCleave

Highlights: GRASSHOPPER populations were heavy and general in western and panhandle counties. Over 242,000 acres were treated under a cooperative Federal-State program, with good to excellent results. SORGHUM MIDGE caused heavy damage to grain sorghums in many areas. PECAN NUT CASEBEARER damage was much higher than in 1957. PINK BOLLWORM populations increased but mortality was high as a result of severe freezes in December. ELM LEAF BEETLE caused extensive damage to Siberian elms in many areas. Infestations of CATTLE LICE increased in 1958 in southern counties. Several species of SCALES and a ZORAPTERON were found for the first time in the State.

Cereal and Forage Insects: A heavy, general GRASSHOPPER infestation occurred in western and panhandle counties, with light to severe damage to sorghums, legumes and rangeland. Populations were heavier throughout the remainder of the State than in 1957, but damage was generally light. An estimated 2,693,182 acres of western rangeland were infested. Approximately 235,000 acres of rangeland in Cimmaron and Texas Counties and 7,000 acres of roadsides in Texas County were treated under a cooperative Federal-State program. An estimated 60,000 acres of rangeland and 20,000 acres of cropland were treated by farmers and ranchers in western and panhandle areas. Results were generally good to excellent. The most abundant species in western counties on rangeland were *Aulocara elliotti*, *Melanoplus packardii*, *Phlibostroma quadrimaculatum* and *Aeoloplides turnbulli* and along roadsides and margins, *A. turnbulli*, *M. bivittatus*, *M. packardii* and *M. bilituratus* predominated. The second-generation hatch of *M. bilituratus* was heavy in the panhandle during late summer, with considerable marginal damage to fall-seeded small grains. The fall egg survey indicated that egg deposition in western and panhandle counties was generally light.

First-generation EUROPEAN CORN BORER (*Pyrausta nubilalis*) populations were higher in Payne County than in 1957. None were found in limited fall surveys in Nowata and Tulsa Counties and only one was found in 1,200 plants inspected in Payne County. CORN EARWORM (*Heliothis zea*) built up in corn fields during late spring and by June, 10 percent of Bixby area corn showed damage. Infestations were common statewide in grain sorghum, alfalfa and other crops until late fall. Damage estimates on corn in central, east central and northeastern areas averaged 1.6 percent loss of grain, slightly less than in 1957. VARIEGATED CUTWORM (*Peridroma margaritosa*) became widespread in alfalfa throughout the State during May. being heaviest in the southwestern area, where larvae averaged 45 per 10 sweeps. Slightly lower counts were reported in central and south central areas. Populations in margins of southwest small grain fields were light. ARMY CUTWORM (*Chorizagrotis auxiliaris*) averaged 1-2 per linear foot of row at Ames during January. Populations which averaged 0.5-1 per square yard in small grain in Beckham and Washita Counties in late March and early April, were slightly lower than those of 1957. ARMYWORM (*Pseudaletia unipuncta*) populations built up during May in central, south central and southwestern areas. Although damage occurred to many small grain fields, losses were less than in 1957. FALL ARMYWORM (*Laphygma frugiperda*) populations in alfalfa and grain sorghums were lower than in 1957. Heavy populations destroyed most volunteer wheat and rye fields in Custer and Dewey Counties in October. Extensive marginal damage to fall-seeded small grain fields necessitated controls. Populations continued low elsewhere. SORGHUM WEBWORM (*Celama sorghiella*)caused light to moderate damage to seed heads in many grain sorghum fields during the summer and early fall, being heaviest in Wagoner and Bryan Counties with up to 20-30 per head in a few isolated fields. SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) infestations occurred in east central, central and southwestern areas during the summer. Second-generation larvae averaged 2 per stalk in field corn in Payne, Caddo and Oklahoma Counties during late August. Populations showed a moderate increase over the 1957 infestation.

SORGHUM MIDGE (Contarinia sorghicola) caused heavy losses to grain sorghum production in central and eastern areas. Adult swarms were reported in sorghum fields in the Stillwater area in late August, with 100 percent loss of seed in some fields. Losses of 20-50 percent were common throughout central and eastern areas in early fall and lighter in southern areas. Adults emerged from infested seed heads as late as mid-October. A check made in late November of a Payne County infested sorghum field showed a 12.2 percent overwintering larval infestation. This was the most serious outbreak in the State in several years. FLEA BEETLES were common on a wide variety of crops from late April to October, statewide. Damage was severe to young corn in late spring and early summer and moderate to heavy to late corn and grain sorghums in the latter part of the summer. Damage to these crops was considerably heavier than in preceding years. GREENBUG (Toxoptera graminum) was heavier in small grains than in 1957 and overall damage in the Kingfisher County area was light on wheat and medium to severe on barley in the spring, with controls applied to some fields. Populations were very light and noneconomic in other areas. Fall buildups were heaviest in northeastern areas, decreasing toward western and southwestern areas. Populations averaged 25-50 per linear foot in the northeast and decreased uniformly to 0-5 in the southwest. Numbers remained fairly constant during December despite subzero temperatures and snow. ENGLISH GRAIN APHID (Macrosiphum granarium) was light and scattered in most northwestern counties in early January. Light infestations were common in other areas during the spring, being slightly higher than in 1957 in southwestern small grains during May. By late May, populations declined rapidly and were not noted again until late December when light numbers appeared in Jackson County. APPLE GRAIN APHID (Rhopalosiphum fitchii) was considerably higher than in 1957 but rarely reached economic levels. Light or medium infestations were common statewide in the spring, with some isolated heavy infestations. Populations decreased in late April, with no further reports until November. Numbers increased statewide for the remainder of the year with averages of 50-150 per linear foot common in north central and northwestern areas and lighter infestations common in other areas.

WINTER GRAIN MITE (Penthaleus major) was common in central and southwesern areas in the spring, but populations were lower than during the same period in 1957. No infestations were noted in the fall and early winter. The only verified reports of BROWN WHEAT MITE (Petrobia latens) were from scattered wheat fields in the panhandle and extreme northwestern areas, which had up to 10 mites per linear foot. CHINCH BUG (Blissus leucopterus) built up in eastern corn fields during May. Moderate to heavy damage occurred to corn and sorghums by mid-June and July in central and east central areas. Numbers remained high in the eastern half of the State the remainder of the season, exceeding those found in 1957. The annual hibernation survey, however, showed the average county ratings to be generally lower. The average ratings dropped in 39 counties from those in 1957, while 30 counties remained the same and 8 increased. Only 10 of the 77 counties showed a potential infestation rating of severe to very severe, compared with 32 in the 1957-58 survey. Light populations of CORN LEAF APHID (Rhopalosiphum maidis) were common in barley statewide and averaged 0-20 per linear foot in the spring and 50-300 in the fall. Infestations were light in sorghums statewide in the early summer, becoming medium to heavy later in the year. Populations increased to 300-1,000 per seed head in some sorghum fields in September and October. A WIREWORM (Conoderus sp.) destroyed a 50-acre field of fall-seeded wheat in the Tonkawa area in November when the population averaged 0.5 larva per square foot. An APHID (Rhopalosiphum subterraneum) was light in Hennessey area small grain fields in early March, but caused no economic damage. ANGOUMOIS GRAIN MOTH (Sitotroga cerealella) larvae were heavy in corn fields at harvest in Nowata, Tulsa and Payne Counties and adults were numerous.

ALFALFA CATERPILLAR (Colias philodice eurytheme) was common in alfalfa from April to mid-October, but numbers remained light and did not become economic. SPOTTED ALFALFA APHID (Therioaphis maculata) remained low statewide during the first half of 1958, being considerably lower than during the same period in 1957. Numbers increased rapidly in southwestern area alfalfa in July, with 300-600 per sweep in Kiowa County, but continued low throughout other areas. Populations in fall-planted alfalfa became severe in central and northwestern areas, with heavy losses in some Enid area fields in October and continued high the remainder of the year despite subzero temperatures, high winds and snow during December. Populations continued low in other areas. PEA APHID (Macrosiphum pisi) appeared in central area alfalfa in early February and was common and on the increase statewide by early April. These numbers remained medium in most areas until the first cutting in mid-May or early June, then declined generally. Populations were very low statewide from early July through mid-November, when a slight buildup occurred in eastern and northeastern fields. This buildup was slow,never exceeding 25 per sweep. The only serious infestation occurred in a vetch field in McClain County in April where numbers reached thousands per 10 sweeps. THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) was collected in the east central area in early April, but did not buildup statewide until mid-July when numbers increased until late October and then decreased gradually until early December. WEBWORMS (Loxostege spp.) were common in alfalfa statewide during the summer, but populations remained well below those of the preceding two years. GREEN CLOVERWORM (Plathypena scabra) numbers were common in alfalfa, but lower than those of 1957. TARNISHED PLANT BUG (Lygus lineolarus) was common in alfalfa over most of the State and averaged 5-25 nymphs and adults per 10 sweeps, which was slightly lower than in 1957. RED-NECKED PEANUTWORM (Stegasta basqueella) appeared on volunteer peanut foliage in early June in Caddo County. Terminal infestations in southwest and north central areas ranged 21-30 percent by the first generation to 60-70 by the fourth generation. Two Payne County fields had 32 percent of shoots and 95-100 percent of buds damaged in late September. Overall losses were lower than in 1957. LESSER CORNSTALK BORER (Elasmopalpus lignosellus) caused considerably less damage to peanuts than in 1957. VETCH BRUCHID (Bruchus brachialis) became fairly common in central and south central vetch fields during late April and May, being heaviest in Logan and McClain Counties where counts averaged 18-50 per 10 sweeps. Counts were considerably lower than in other fields. Other insects which damaged a variety of cereal and forage crops to a limited degree included CLOVER LEAF WEEVIL (Hypera punctata), SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi), BLISTER BEETLES (Epicauta spp.), SNOWY TREE CRICKET (Oecanthus niveus), HARLEQUIN BUG (Murgantia histrionica), POTATO LEAFHOPPER (Empoasca fabae), RAPID PLANT BUG (Adelphocoris rapidus), RED HARVESTER ANT (Pogonomyrmex barbatus), LEAF-FOOTED BUG (Leptoglossus phyllopus), THRIPS and SUBTERRANEAN TERMITES.

Fruit Insects: PECAN NUT CASEBEARER (Acrobasis caryae) damage was higher than in 1957. Larval entries in nut clusters averaged up to 33 percent in some areas by midsummer. Damage in the Okemah-Okmulgee area was considered heavy for the year. EASTERN TENT CATERPILLAR (Malacosoma americanum) became common on native plums in the southern area during April and by early May was statewide,with severe damage in some western counties. PEACH TREE BORER (Sanninoidea exitiosa) caused less damage than in 1957. SPRING CANKERWORM (Paleacrita vernata) was very abundant in late April on plum, peach, apple, elm and oak in north central, central and south central areas. WOOLLY APPLE APHID (Eriosoma lanigerum) infested apple trees in the north central, east central and southeastern areas during spring and summer. PECAN WEEVIL (Curculio caryae) populations continued low but were higher than in 1957. WALNUT CATERPILLAR (Datana integerrima) caused slightly more damage than in 1957, with light to moderate defoliation in most areas and heavy defoliation in local areas. BLACK-MARGINED APHID (Monellia costalis) averaged 15-30 per pecan leaflet in the Payne County area during October and early November and counts throughout 1958 were higher than in 1957. A PECAN CATOCALA (Catocala maestosa) caused heavy to severe damage in one area of Okfuskee County and light damage over the State and a CURCULIO (*Conotrachelus retentus*) caused severe damage to a walnut grove in Okfuskee County in early June. RED-NECKED CANE BORER (*Agrilus ruficollis*) populations in brambles in the Payne County area were lower than in past three years. HICKORY SHUCKWORM (*Laspeyresia caryana*) larvae averaged 1-4 per infested shuck in approximately 90 percent of pecan shucks in the Stillwater area in late November. Pecans were also damaged by PECAN LEAF PHYLLOXERA (*Phylloxera notabilis*), an APHID (*Monellia caryae*) and STINK BUGS. Minor damage was caused to a variety of fruit crops by CODLING MOTH (*Carpocapsa pomonella*), PLUM CURCULIO (*Conotrachelus nenuphar*), FALL ARMYWORM (*Laphygma frugiperda*), APPLE LEAF TRUMPET MINER (*Tischeria malifoliella*), SAN JOSE SCALE (*Aspidiotus perniciosus*), PUTNAM SCALE (*A. ancylus*) and SPIDER MITES.

Truck Crop Insects: SEED-CORN MAGGOT (*Hylemya cilicrura*) caused moderate damage to roots and stems of seedling spinach in the Bixby area during October and heavy populations of GREEN PEACH APHID (*Myzus persicae*) occurred on some untreated east central area spinach fields during the spring and fall. VARIEGATED CUTWORM (*Peridroma margaritosa*) damaged tomato plants at Stillwater in late May and a SAND WIREWORM caused some damage to young tomato plants in the east central area in late April and early May. TURNIP APHID (*Rhopalosiphum pseudobrassicae*) was heavy on turnips and mustard greens in scattered areas during November, while BEAN LEAF BEETLE (*Cerotoma trifurcata*) was light to prevalent in central and east central area bean fields in late summer. Damage to a variety of crops was caused by CORN EARWORM (*Heliothis zea*), FALL ARMYWORM (*Laphygma frugiperda*), MELON APHID (*Aphis gossypii*), SQUASH BUG (*Anasa tristis*) and *Lygus* spp.

Cotton Insects: COTTON LEAFWORM (*Alabama argillacea*) populations were lighter statewide than they had been for the past several years. BOLLWORMS (*Heliothis* spp., et al.) caused generally light damage throughout the season. Gin stand and lint cleaner inspections for PINK BOLLWORM (*Pectinophora gossypiella*) during January and February were positive in eight Red River counties. A survey of stalk and surface debris in 18 eastern counties during March was negative. The first larva collected during the 1958 growing season was taken in early September in Tillman County from lint cleaner inspections. Infestations were heavier in the southwest and south central areas than in 1957. Gin trash and lint cleaner inspections were positive in 18 south central and southwestern counties by late September. Inspections of dry bolls taken from stalks and on the ground after severe freezes during December, showed a very high larval mortality. CABBAGE LOOPER (*Trichoplusia ni*) was generally light in central, south central and southwestern areas with ragging in a few isolated fields of rank cotton in late August and early September. Numbers were lower than for the past two years. BOLL WEEVIL (*Anthonomus grandis*) was generally light, with only late squares showing severe damage, which averaged up to 70 percent in many areas. COTTON APHID (*Aphis gossypii*) was generally light with only localized heavy populations. COTTON FLEAHOPPER (*Psallus seriatus*) was light throughout the season, with heaviest populations of 40-50 per 100 terminals in the east central area during June. Numbers were considerably below those of 1957. THRIPS were of only minor importance. COMMON STALK BORER (*Papaipema nebris*) caused considerable damage in localized areas of Caddo County during June. Oviposition of TREE CRICKETS (*Oceanthus* spp.) caused alarm in certain southwest areas in July. Approximately 3 percent damage resulted in the breaking off of stalks in fields with heaviest infestations.

Forest, Ornamental and Shade Tree Insects: IPS BEETLES (*Ips*. spp.) were very light in southeastern pine forests during late summer, being found only in cut-over areas and mechanically damaged trees. BLACK TURPENTINE BEETLE (*Dendroctonus terebrans*) was light in southeastern area and largely restricted to stumpage and "lightning strikes." ELM LEAF BEETLE (*Galerucella xanthomelaena*) heavily defoliated central and east central Siberian elms in the summer and early fall. Other varieties were attacked less severely. Controls were used in many localities. Three generations were completed by September 6 when adults began invading homes. NANTUCKET PINE MOTH (*Rhyacionia frustrana*) caused heavy damage to central area pines and larvae fed until late September in the Stillwater area, where pupation was nearly complete in early October and damage ceased. ELM CALLIGRAPHA (*Calligrapha scalaris*) was widespread in central and north central areas. Large numbers entered hibernation in Blaine County in mid-October. A BUCK MOTH (*Hemileuca nevadensis*) was heavy and active in southeastern Ellis County on shinery oak during late October. During mid-October, ELM LEAF APHID (*Myzocallis ulmifolii*) counts of 2-7 per leaf were common on elms in the Stillwater area. LEAF GALLS were heavy on persimmon in the Okemah area in late spring and very heavy on leaves of scattered elms in the Stillwater area in midsummer SYCAMORE LACE BUG (*Corythucha ciliata*) damaged sycamore in Le Flore County in late August and HAWTHORN LACE BUG (*C. cydoniae*) was abnormally heavy on Payne County pyracantha in early October. Several species of SCALES, including *Coccus hesperidum* and *Saissetia oleae*, were reported from a variety of plants. Scales reported for the first time from the State included *Phenacoccus solenopsis*, *Rhizaspidiotus dearnessi*, *Apsidiotus pseudospinosus*, *Lepidosaphes beckii*, *Pinnaspis aspidistrae* and *Toumeyella* sp., probably *parvicorne*. Other insects which caused damage included BAGWORM (*Thyridopteryx ephemeraeformis*), SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus*), SAWFLIES, WHITEFLIES and SPIDER MITES.

Insects Affecting Man and Animals: COMMON CATTLE GRUB (*Hypoderma lineatum*) - Most grubs had emerged from the backs by late February. Counts were much lower in mature animals in Harper County in January than in yearling steers. In December, counts were lower in Woodward, Canadian and Kiowa Counties than in Harper County. HORN FLY (*Siphona irritans*) was active on cattle from April to November but populations were lighter than in 1957. TABANID populations were well below those of 1957, with heaviest counts reported from Latimer County in August. STABLE FLY (*Stomoxys calcitrans*) populations were slightly higher than in 1957 with peaks during September in the north central area. HOUSE FLY (*Musca domestica*) remained low most of the year, but was extremely high in sheltered areas of Payne and Sequoyah Counties during early October. Egg laying by HORSE BOT FLIES (*Gasterophilus* spp.) on horses was heavy in northeastern, medium to heavy in central and north central and light to medium in southern areas during October and November. SCREW-WORM (*Callitroga hominivorax*) populations were low. CATTLE LICE were the heaviest in several years in southern counties during March and April. FLEAS were very numerous in many central area homes and yards in the summer and early fall. BROWN DOG TICK (*Rhipicephalus sanguineus*) was troublesome in homes all year, EAR TICK (*Otobius megnini*) was heavy in isolated areas in September and November and WINTER TICK (*Dermacentor albipictus*) averaged 4 per square inch on necks and heads of cattle in the southeastern area during late November.

Stored-product Insects: SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*) was generally light. A few severe and heavy infestations of LESSER GRAIN BORER (*Rhyzopertha dominica*) occurred in north central, eastern and southwestern areas. Statewide surveys during March showed INDIAN-MEAL MOTH (*Plodia interpunctella*) present in 50 percent of the establishments checked, with approximately 5 percent rated as severe. RED FLOUR BEETLE (*Tribolium castaneum*) was scattered and light to heavy in approximately 20 percent of the mills, warehouses and farm-stored grain checked. CADELLE (*Tenebroides mauritanicus*) was light and scattered. DERMESTIDS were light to heavy in approximately 40 percent of the inspections made. A few RICE WEEVIL (*Sitophilus oryza*) infestations varied from light to severe. FLAT GRAIN BEETLE (*Laemophloeus pusillus*) infestations were found only in the eastern and northeastern areas. All surveys for KHAPRA BEETLE (*Trogoderma granarium*) were negative.

Beneficial Insects: CONVERGENT LADY BEETLE (Hippodamia convergens) was present in most alfalfa fields surveyed by mid-April and numbers remained high during the remainder of the year, and materially reduced aphid populations in some areas. LACEWINGS (Chrysopa spp.) were generally abundant in most alfalfa fields as were NABIDS (Nabis spp.). BEE FLY larvae contributed substantially to grasshopper egg destruction in the panhandle area in the fall and Sarcophaga kellyi larvae affected approximately 20 percent of the grasshopper population in the same area. Populations of a COCCINELLID (Olla abdominalis) aided in the reduction of aphid numbers on elms in the Stillwater area in late October.

Miscellaneous Insects: Surveys for IMPORTED FIRE ANT (Solenopsis saevissima richteri) in southeastern counties were negative. RED HARVESTER ANT (Pogonomyrmex barbatus) was active statewide by April. A ZORAPTERON (Zorotypus hubbardi) was found in decaying sawdust at Harris, December 31, a first record for the State.

SUMMARY OF INSECT CONDITIONS - 1958

MISSOURI

Reported by G. W. Thomas, Stirling Kyd and R. E. Munson

Insect Outbreak Highlights: Heavy infestations of CORN FLEA BEETLE appeared on southwest area seedling corn in early May and were common statewide, by midmonth. Counts ranged 1-8 per plant with 90-100 percent of stand showing some degree of damage. Adult counts reached 12-23 per plant during second half of June and bacterial wilt incidence was very high over southern and central areas. ARMYWORM appeared 3 weeks later than for past 4 years. Small larvae, in economic numbers, were present in small grains in the extreme southeast area by mid-May. By late May and early June, damage was moderate to heavy in widely scattered central and northwestern area barley, wheat and fescue fields. CHINCH BUG migration from overwintering habitats was completed by mid-May. Moderate to heavy damage occurred on small corn, grain sorghums and Sudan grass through most of June in scattered areas of several southwestern, west central and north central counties. Overwintering survey in 26 counties showed ratings of severe in 6, moderate in 5, light in 2, noneconomic in 12. Following the alltime high overwintering larval populations of 1957, first-generation EUROPEAN CORN BORER egg mass counts ranged 100 to over 400 per 100 plants of early corn. High larval infestations failed to develop except in a few fields and second-generation egg mass and larval counts declined in most areas. The State average for districts surveyed in 1958 was 96 compared with 346 in 1957.

GARDEN WEBWORM was locally very severe during early June in parts of southwest, west central and extreme southeast areas, with alfalfa, corn and soybeans damaged in southwest and west central areas and soybeans, cotton and alfalfa in the southeast. A second severe outbreak occurred in late July in the extreme southeast area, damage being confined largely to late-planted soybeans, cotton and alfalfa. GRAPE COLASPIS caused widely scattered severe damage by June to small soybeans and corn in some extreme southeast fields where lespedeza had been plowed down. Similar damage occurred to widely scattered central and northwest area corn, soybeans and grain sorghums by late June. Egg-hatch of VARIEGATED CUTWORM began in the southwest area by mid-May and continued well into June, and moderate to heavy damage occurred to new-growth alfalfa, red clover, improved pastures, gardens and flower beds except in the northeast area. COTTON APHID built up during late June, with light to moderate leaf curling common throughout the cotton area. A spectacular COCCINELID population developed in late June and by early July the aphid problem was eliminated with practically no controls necessary. Mixed populations of SPIDER MITES increased from late June through August and damage increased from spot defoliation to complete defoliation over large areas of several counties. First and second generations of NANTUCKET PINE MOTH were moderate to severe over much of the southern third of the State, but third and fourth generations failed to develop, resulting in a lower overwintering population than in past several years. SPRING CANKERWORM larvae caused scattered moderate to heavy defoliation of elms in western and central areas. MOSQUITO outbreaks occurred throughout the State following heavy rains and flooding during early and mid-July.

New or Unusual Records: PECAN LEAFROLL MITE (*Aceria caryae*), first reported from pecans in 1957, heavily infested cultivated varieties in areas of southern Dunklin and Pemiscot Counties. WALNUT BLISTER MITE (*A. erinea*) was taken from black walnut at Columbia. PEAR LEAF BLISTER MITE (*Eriophyes pyri*) was recorded from nursery stock near St. Joseph, Buchanan County, the second record for the State since 1922. A DAGGER NEMATODE (*Xiphinema americanum*), first reported from soil in the extreme southeast part of the State in 1955, was taken from cotton near Morley, Scott County, in 1958. EUROPEAN CORN BORER (*Pyrausta nubilalis*) was recorded for the first time from Douglas and Ozark Counties,making all 114 counties of the State infested. Very light numbers of SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) were recorded in Douglas, Ripley and Dunklin Counties. The latter county marks the easternmost advance of this pest in the State and establishes it in the extreme southeastern delta farmlands.

Corn Insects: (Reported by Munson, Peters, Jackson, Kyd, Thomas). DINGY CUTWORM (*Feltia subgothica*) and YELLOW-STRIPED ARMYWORM (*Prodenia ornithogalli*) caused light damage to widely scattered fields of small corn in extreme southwestern area the last of May. ARMYWORM (*Pseudaletia unipuncta*) caused light to moderate marginal damage to widely scattered fields of small corn in early June, where the fields adjoined heavily infested small grains or pastures. DINGY CUTWORM damage to a few fields of corn up to 36 inches high necessitated replanting in the Missouri River bottom in the central portion of the State and a very few fields in river bottom areas in the extreme northwest. WIREWORM (mainly *Melanotus* spp.) infestations were the lightest in the past 6 years, with no area showing more than a fraction of 1 percent loss. CORN FLEA BEETLE (*Chaetocnema pulicaria*). (see highlights). A few widely scattered northwestern area fields had small spots yellowed and dwarfed by CORN ROOT APHID (*Anuraphis maidi-radicis*) with counts of 20-55 per infested plant. Damage to a few fields of small corn by GRAPE COLASPIS (*Colaspis* sp.) varied from portion within fields to entire fields destroyed in southeast, central and northeast areas, and occurred only in fields where lespedeza was plowed under prior to seeding. CHINCH BUG (*Blissus leucopterus*), GARDEN WEBWORM (*Loxostege similalis*) and EUROPEAN CORN BORER (*Pyrausta nubilalis*). (see highlights).

CORN LEAF APHID (*Rhopalosiphum maidis*) was light to moderately heavy on corn in all areas from mid-July through August, but there was no evidence of injury or yield reduction from any of the heavier infestations. Larval feeding by NORTHERN CORN ROOTWORM (*Diabrotica longicornis*) caused spotty lodging in scattered fields along creek and river bottoms in southeast and central areas, and adults ranged 1-18 per silking ear during late July and early August. FALL ARMYWORM (*Laphygma frugiperda*) was light to moderate on small corn in the extreme southeast area by early July and during periods of hot weather larvae were again observed just below the ground line, causing injury similar to cutworm feeding. Light to moderate infestations were common throughout the southern half of the State by early August, with 1-4 larvae per stalk and 20-53 percent of stalks infested. The first CORN EARWORM (*Heliothis zea*) record for the season was from a light trap at Sikeston on May 10. Damage to corn was considerably less than during preceding years, with 1-5 percent of stalks damaged over the southern half of the State. Examination of 1,500 ears in 60 counties in the fall revealed 91.6 percent of the ears damaged with an estimated loss of 3.25 percent of the grain. Following entrance into stalks of the first-brood

European corn borers, CORN SAP BEETLES (*Carpophilus* spp.) became very abundant and continued high during the season. Damage to ears by larvae and adults was less than previous years. Examination of girdled stalks in late April in 6 extreme southwestern counties showed a 1.5 percent survival of overwintering SOUTHWESTERN CORN BORER (*Zeadiatraea grandiosella*) larvae. First-brood infestation was very light and succeeding generations failed to increase their potential. Fall survey showed percentage of girdled stalks to be less than any preceding year, with an average of 6.3 percent in 8 southwestern counties. Survey of 28 counties gave negative results in 5, and new records for Douglas, Ripley and Dunklin Counties.

Grain Sorghum Insects: (Reported by Munson, Jackson, Kyd, Thomas). CHINCH BUG. (see highlights). CORN LEAF APHID (*Rhopalosiphum maidis*) populations were low throughout much of the season, except in the extreme southeastern area where counts were 500-1,000 per plant in early July. Predators build up rapidly and there was no discoloration to leaves or crop damage. By late August, CORN EARWORM (*Heliothis zea*) counts ranged 0-60 per 100 heads, with heavier infestations in southwest and south central areas where loss ranged 5-25 percent of grain destroyed. Populations were light or noneconomic in the remainder of the State. FALL ARMYWORM (*Laphygma frugiperda*) larval counts averaged 1-6 per 100 heads over southwest and south central areas and occurred in conjunction with corn earworm. SORGHUM WEBWORM (*Celama sorghiella*) larvae averaged 0-5 per head in widely scattered fields throughout extreme southern counties by late August. Populations and infested fields gradually increased during early September, but most damage was noneconomic. Very few fed in tassels of late-planted corn and seed heads of Johnson grass. Noneconomic to low numbers of SORGHUM MIDGE (*Contarinia sorghicola*) occurred in several extreme southeast area fields. Adults were reared from seed heads of Johnson grass and purpletop. A few fields had 1-4 percent of head stalks broken over by EUROPEAN CORN BORER (*Pyrausta nubilalis*) larval feeding and a very few third and fourth-instar larvae fed in heads before boring into stalks.

Cereal Insects: (Reported by Munson, Kyd, Thomas). WINTER GRAIN MITE (*Penthaleus major*) populations were extremely low in all southwest area small grain fields. ENGLISH GRAIN APHID (*Macrosiphum granarium*) averaged 0-5 per linear foot of row in barley, rye and wheat over the southern third of the State by mid-April. Populations gradually increased, and when wheat began to head in late May counts ranged 5 to over 200 per linear foot, with the heavier infestations in the southwest area. Populations in heads of wheat did not develop as expected and infested fields averaged 4-15 aphids per head in most areas. No infestations of GREENBUG (*Toxoptera graminum*) were observed although there were several reports from the southwest area, none of which were confirmed. SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) was considerably lighter than in 1957, with counts of 1-2 per sweep in margins of some barley fields scattered over southwest and south central areas. No damage was evident. For ARMYWORM and CHINCH BUG, see highlights. A large number of wheat fields over the western half of the State had 1-20 percent of the straws broken from HESSIAN FLY (*Phytophaga destructor*) feeding immediately prior to harvest. Stubble survey during July and August failed to show any increase in percentage of infested straws or number of "flaxseed", and showed a State average of 2.6 percent of straws infested in 58 counties. The highest county average of 17.2 percent was in Lafayette County.

Legume and Pasture Insects: (Reported by Blickenstaff, Brown, Jackson, Kyd, Munson, Peters, Thomas). PEA APHID (*Macrosiphum pisi*) averaged 2-15 per sweep on alfalfa in the southern half of the State by mid-April and gradually increased during May to 112 per sweep in this area and 100-500 per sweep in the northwest area. A fungus disease, in conjunction with parasites and predators, became abundant in May, when up to 95 percent of populations in many fields were diseased. No successful overwintering of SPOTTED ALFALFA APHID (*Therioaphis maculata*) was observed. Adults were not found on alfalfa until August in the southwest, but built up to 135 per sweep in some south central and southwest area fields. VARIEGATED CUTWORM (*Peridroma maragitosa*). (see highlights). POTATO LEAFHOPPER (*Empoasca fabae*) appeared on extreme southeastern alfalfa on May 6. Populations increased slowly and averaged 1-7 adults and nymphs per sweep by late July, with the heavier numbers in northeast and north central areas. Slight yellowing of leaves occurred in more heavily infested fields. GARDEN WEBWORM (*Loxostege similalis*). (see highlights). THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) commonly occurred in very low numbers in southwest and central area alfalfa fields and in widely scattered southeast area fields. Girdled stems never exceeded 0.25 percent in any area and counts were generally less than 1 per 100 sweeps. BLISTER BEETLES (*Epicauta* spp.) stripped or severely damaged small areas within a few scattered alfalfa fields in the southern half of the State. During September *E. pennsylvanica* averaged 1-3 per sweep with some light damage to terminal growth and flower heads. Small spots in a very few soybean fields were defoliated by *Epicauta* sp. in the extreme southeast area. CLOVER LEAF WEEVIL (*Hypera punctata*) larval populations were considerably lower than in past several years, with counts of 0.5-2 larvae per crown of red clover and alfalfa in most areas by mid-April. A fungus disease increased during April and largely eliminated larval populations by May. CLOVER ROOT CURCULIO (*Sitona hispidula*) and SWEETCLOVER WEEVIL (*S. cylindricollis*) were considerably lower than during the past several years. Root feeding and foliage injury were light and confined to a few scattered 3 to 5-year-old alfalfa and red clover fields. Mixed populations of CLOVER APHID (*Anuraphis bakeri*) and YELLOW CLOVER APHID (*Therioaphis trifolii*) were very light except in the northwest where infestations gradually increased on first-cutting red clover during June. No economic injury occurred because of predators and adverse weather conditions. Populations of LESSER CLOVER LEAF WEEVIL (*Hypera nigrirostris*) continued to decline throughout the State,with no more than 20 percent of stems showing larval damage. DINGY CUTWORM (*Feltia subgothica*) was generally lighter in pastures, alfalfa and red clover than in past several years. Heaviest infestations averaged 1-2 per square yard in a few central area red clover fields. SWEETCLOVER APHID (*Myzocallidium riehmi*) was commonly very light in sweetclover over the northern half of the State. Populations of PLANT BUGS (mainly *Lygus lineolarus*) varied considerably over the State. By late July, *L. lineolarus* ranged 2-14 adults and nymphs per sweep of northeast area alfalfa which appeared to be the most heavily infested area within the State.

WHEAT STEM MAGGOT (*Meromyza americana*) destroyed 1-2 percent of bluegrass seed stems in the northwest area and an occasional stem of orchardgrass and wheat in western and northern areas. GRASSHOPPERS (*Melanoplus differentialis*, *M. bivittatus*, *M. femur-rubrum* and *M. bilituratus*) - Egg hatch occurred from early May through most of June. Nymphal populations were the lowest in 6 years,except in scattered isolated fields or farms in the western third of the State where counts ranged up to 35 per square yard of margin. Populations were reduced to noneconomic numbers over the State by heavy rains in July except in widely scattered fields in west central and northwest areas. No damage occurred to field crops. GREEN CLOVERWORM (*Plathypena scabra*) larvae ranged 1-6 per linear foot of row on soybeans in the extreme southeast where considerable ragging of foliage occurred in some fields. Populations were lighter in all soybean-producing areas. Larvae ranged up to 2 per sweep in many alfalfa fields over the southern half of the State. THRIPS caused some silvering of soybean leaves in the extreme southeast and in scattered fields over the remaining soybean-producing areas. Initial injury was light. CORN EARWORM (*Heliothis zea*) larvae averaged 1-2 per yard of row in a few soybean fields scattered over the west central area. Damage was moderate to severe, occurring when plants were 6-11 inches high. Most plants recovered in time to produce a normal crop. GRAPE COLASPIS (*Colaspis* sp.). (see highlights). BEAN LEAF BEETLE (*Cerotoma trifurcata*) adults ranged 1-3 per linear foot of germinating soybeans and garden beans in the central area by late May. By August, counts decreased in the central area but increased to 2-4 adults per linear foot of row in the extreme southeast and caused considerable ragging of foliage but little or no injury to blossoms, newly set pods or seeds. STINK BUGS (Acrosternum hilare, Euschistus servus and E. variolarius) increased greatly in soybean fields throughout the State in late season. Adults and nymphs of A. hilare were common on soybeans, while mainly adults of the other two species were found. Some species fed on the beans within the pods and the extent of the damage was not fully determined. The quality and oil content of the beans upon which they fed were probably reduced. The known SOYBEAN CYST NEMATODE (Heterodera glycines) infested area is confined to the 3 extreme southeast counties of Stoddard, New Madrid and Pemiscot. Samples were taken from 7,415 fields comprising 197,085 acres of soybeans and lespedeza land in 70 counties. As of December 31, 112 fields are known to be infested, totaling 3,940 acres.

Fruit Insects: (Reported by Enns). Apples - APPLE APHID (Aphis pomi) numbers were few and STINK BUGS (Euschistus spp.) were present in scattered infestations in May. By mid-May a few reports of ROSY APPLE APHID (Anuraphis roseus) were received. CODLING MOTH (Carpocapsa pomonella) was largely in the pupal stage by mid-May with first adult being taken May 17, but second-brood moths appeared on schedule in early July. Controls were satisfactory and only very few third-brood moths were noted in August. By mid-May a few RED-BANDED LEAF ROLLERS (Argyrotaenia velutinana) were noted. First and second-broods, although not overly abundant, caused considerable damage just as Jonathan picking began. No reports of FORBES SCALE (Aspidiotus forbesi) infestations were received during the season. Peaches - The abundant crop in the southeast and Kansas City areas was attacked as usual by ORIENTAL FRUIT MOTH (Grapholitha molesta), PLUM CURCULIO (Conotrachelus nenuphar), LYGUS BUGS and STINK BUGS. Most growers obtained good control and no unusual problems appeared. Grapes - The major problem in the Rosati area was a heavy outbreak of MEALYBUGS which became evident by May 20 and continued until mid-August. Most growers achieved good control and there was no apparent loss. Small numbers of GRAPE BERRY MOTH (Paralobesia viteana), GRAPE LEAF FOLDER (Desmia funeralis) and LEAFHOPPERS were noted but caused no serious injury. GRAPE SCALE (Aspidiotus uvae) continued troublesome near Kansas City. GRAPE ROOT BORER (Vitacea polistiformis) was found in grape roots at Rosati in mid-June.

Cotton Insects: (Reported by Harrendorf, Hare, Thomas). The 1958 growing season was generally good, but there was an unprecedented drought during May and early June that delayed germination and necessitated some replanting in scattered areas of several southern counties. Rainfall was ample during the remainder of the season and was followed by an excellent harvesting season. MIRIDS (including Lygus lineolarus and Adelphocoris rapidus) - Economic populations of the flea-hopper complex developed in early August, two weeks later than in 1957. There was no apparent difference in square set or yield in a few fields operated under an early season control program, when compared with surrounding untreated fields. Widely scattered marginal infestations of SPIDER MITES (mainly Tetranychus atlanticus) began in late May and early June. By July, marginal and spot controls were applied in several counties. Infestations built up and spread and caused defoliation over much of the cotton-growing area by mid-August. Populations declined in all counties by early September. Controls were widely used, with failures reported from all chemicals recommended. BOLLWORM (Heliothis spp., et al.) infestations were low until late July when an increase began and reached a peak by September. Egg counts were unusually high in early September, but subsequent larval infestations failed to develop. Good control was obtained with 1-3 applications in more heavily infested fields.

No live BOLL WEEVILS (Anthonomus grandis) were recovered from ground trash during the spring and very few apparently successfully overwintered, as the first field infestations were detected in mid-July, two weeks later than in 1957. Numbers slowly increased, with a peak in late September. A few fields were treated with only moderate success in late August and early September in Butler, Dunklin and

Stoddard Counties. Little damage resulted to the late top crop. SEED-CORN MAGGOT (*Hylemya cilicrura*), CUTWORMS (*Agrotis ypsilon* and *Feltia subgothica*) and COTTON LEAFWORM (*Alabama argillacea*) were not problems in 1958. COTTON APHID (*Aphis gossypii*) built up to outbreak proportions over the entire cotton-growing area by early June and began to curl leaves when parasites and predators rapidly increased and eliminated the problem. STALK BORER (*Papaipema nebris*) marginal damage became apparent in widely scattered fields in Butler, Dunklin and Stoddard Counties during June and early July, with 0.5-6 percent of the stalks killed in the first 4-8 marginal rows. A heavy outbreak of GARDEN WEBWORM (*Loxostege similalis*) followed the aphid outbreak in June in those fields treated for aphid control. A second outbreak occurred in late July on cotton, soybeans and alfalfa. A few third-brood larvae of EUROPEAN CORN BORER (*Pyrausta nubilalis*) were found for the fourth consecutive year boring in main stems and bolls in several counties. PINK BOLLWORM (*Pectinophora gossypiella*) - Inspection of 123 lint cleaners and 1,613 bushels of gin trash from 73 gins in 7 counties gave negative results for pink bollworm.

SURVEY METHODS

FLY BAITS AND TRAPS

Preliminary tests in Colorado during 1956 showed that fly baits sprayed on beet plants gave rather spectacular results on kills of adult sugar beet root maggots. In 1957 bait traps, using several attractants, particularly hydrolysate materials, were found to attract a wide variety of Diptera. Tests during 1957, beginning in April and continuing weekly until October, gave population data on sugar beet root maggot, seed-corn maggot, western wheat stem maggot and spinach leaf miner. This method has also proved very successful in determining emergence, broods and seasonal activity of these four pests. The study of baiting technique was expanded in 1958.

Materials used in Bait Traps for Sugar Beet Root Maggot Adults 1957

A. Dylox, 1 oz., sugar 1 lb., water 2 qts.

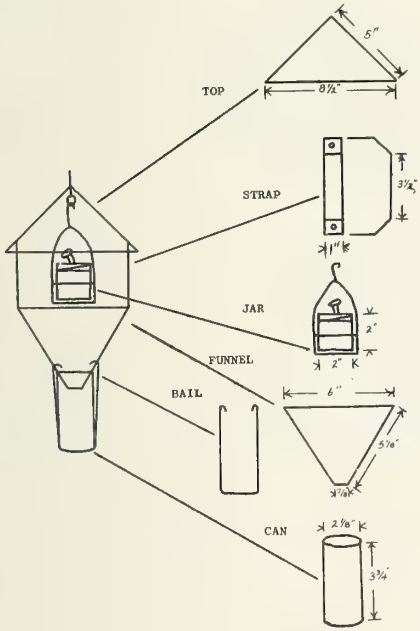
B. Dylox, 1 oz., sugar 1 lb., water 2 qts., yeast hydrolysate 1/2 oz.

C. Dylox, 1 oz., sugar 1 lb., water 2 qts., casein hydrolysate 1/2 oz.

D. Dylox, 1 oz., sugar 1 lb., water 2 qts., soy hydrolysate 1/2 oz.

E. Dylox, 1/2 oz., water 1 pt., protein bait No. 2* 4 oz.

F. Dylox, 1/2 oz., water 1 pt., protein bait No. 7* 4 oz.



Fly Bait Trap

Trapping Procedure and Results

A wood cylinder 1.25 inches in diameter by 3 inches long, or a corn cob 3 inches long, was dipped in one of the above baits and suspended over the 6-inch funnel of a Japanese beetle trap or a similar funnel-type trap. (see illustration). Flies attracted to the bait dropped into the container under the funnel. All of the above baits caught adults of the sugar beet root maggot. Bait A caught the most and bait D was next in numbers. Bait B, containing yeast hydrolysate, fermented and did not attract many of the root maggot flies but did attract and kill many sarcophagids and calliphorids. In 1958, the bait traps were modified by replacing the corn cob with a wick in a two (2) ounce salve jar. (L. E. Jenkins).

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* Protein bait contains amino acids.

See CEIR 9(10):159

Uniform Survey Procedure Approved By
The Lake States Forest Insect Survey Committee - 1959

BALSAM GALL MIDGE DAMAGE APPRAISAL SURVEY

Addendum

Control of the balsam gall midge through management or insecticides has not yet been reduced to practical levels. Recommendations concerning this insect, hence are directed not toward its control but toward the prevention of damaged trees reaching the market. The following marketing practices are recommended.

1. Trees moderately to heavily infested will not be marketed.
2. Trees lightly infested may be marketed if needle galling was no heavier than moderate the previous year.

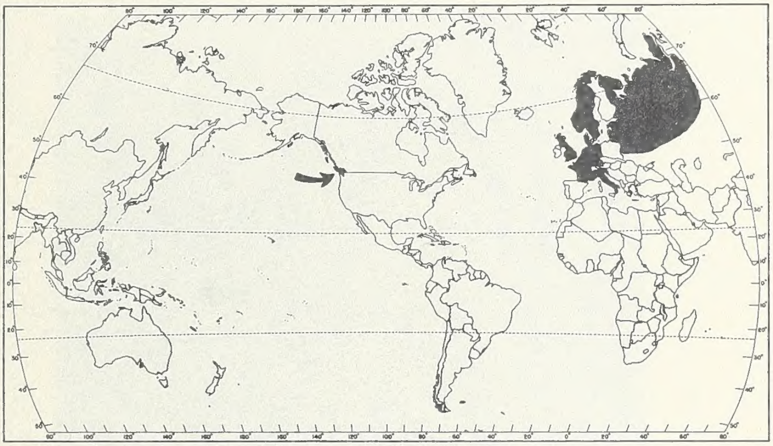
R. L. Giese, D. M. Benjamin

INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

A BRAMBLEBERRY LEAFHOPPER (*Macropsis fuscula* (Zetterstedt))

Economic Importance: An outbreak of this leafhopper was discovered on loganberry on Lulu Island, British Columbia, in 1952. It had not been reported previously from North America. Heavy infestations have occurred yearly since 1952 in the Lulu Island area causing considerable damage to various brambleberries through feeding on flowers and fruit and through heavy deposits of honeydew. The infestations have been difficult to control. Although the insect has been known to cause direct plant damage for some time, it assumed a more important economic status when it was shown to be the vector of the destructive *Rubus* stunt virus of Europe in 1953. This virus is not known to occur in North America.

Symptoms of *Rubus* virus on loganberry are as follows: New canes weak, short, thin, much more numerous than usual, giving bushy appearance. The following season weak canes generally fail to flower. Flowers on infected canes less numerous than normal and may be malformed, floral parts becoming foliar. Disease is progressive, plant becoming more stunted and bushy in successive years. On raspberry, best diagnostic characters are late development and shortness of laterals early in season.



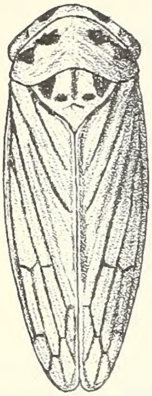
General Distribution of *Macropsis fuscula*

Distribution: Europe (Italy, France, Belgium, Netherlands, Germany, England, Denmark, Norway, Sweden, Finland, northern USSR) and British Columbia, Canada.

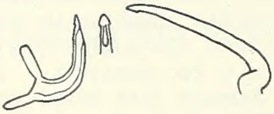
Hosts: *Rubus* spp. (loganberry, raspberry, thimbleberry, blackberry, et al.).

Life History and Habits: The insect overwinters in the egg stage in canes of wild and cultivated *Rubus* spp. In British Columbia, the eggs hatch in late May, about the time loganberries begin to blossom. Nymphs are numerous by mid-June, with as many as 7 per cluster of fruit buds in some plantings. There are 5 instars, each stage requiring about 10 days. Adults appear in mid-summer. Apparently there is only one generation a year. In the Netherlands, the virus is spread from old to new berry plantations by adults.

(Cicadellidae, Homoptera)



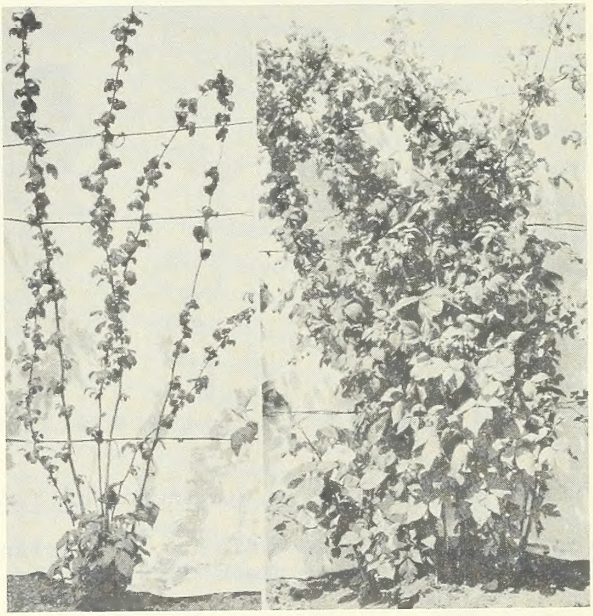
Adult



Male Genitalia

Macropsis fuscula

Description: According to Beirne - Length 4.5-5.0 mm. Dull yellowish-brown to light fuscous; markings of head, pronotum and scutellum black; veins of forewings fuscous or blackish. Distinctive features: black spot at base of hind tibiae; rounded or comma-shaped spot beneath each ocellus, a smaller spot beneath each of these; a large, elongate pair lower down and the sides of the clypeus black. Size of black markings and general color of insect variable. Other North American species having black-spotted tibiae may be readily distinguished from fuscula by the absence of dark facial spots and by host plants. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies.) CEIR 9 (12) 3-20-59.



Left: Stunted Right: Normal

Norfolk Giant Raspberry

Figures (except map): Adult and male genitalia from Beirne, B. P. 1956. Canad. Ent. 88(Suppl. 2), 180 pp. Stunted and normal growth of raspberry from Prentice, I. W., 1951. Jour. Hort. Sci. 26(1):35-42.

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